

**DEPARTMENT OF ENVIRONMENTAL QUALITY
PERMITTING and COMPLIANCE DIVISION
MONTANA POLLUTANT DISCHARGE ELIMINATION SYSTEM
(MPDES)**

Statement of Basis

PERMITTEE: US Bureau of Reclamation

PERMIT NUMBER: MT0022578

RECEIVING WATER: South Fork Flathead River

FACILITY INFORMATION:

Name: Hungry Horse Dam and Power Plant

Location: Hungry Horse, MT 59919

Mailing Address: P.O. Box 190130
Hungry Horse, MT 59919

Contact: Dennis Philmon, Supervisory Facility Operations Specialist
Telephone: (406) 387-5241

FEE INFORMATION:

Number of Outfalls: 4 (for fee determination purposes)

Type of Outfall: 001 – Treated Domestic Wastewater
002 – Station Unwatering Sump
003 – Station Drainage Sump
004A through D – Individual Generator Non-contact Cooling
Water

I. Permit Status

The current Montana Pollutant Discharge Elimination System (MPDES) permit for the U.S. Bureau of Reclamation (USBOR) Dam and Power Plant Wastewater Treatment Plant (WWTP) was issued July 18, 1995 and became effective September 1, 1995; it expired midnight, January 31, 2000. On June 29, 1999, the permittee submitted Short Form 2A and the associated fees for renewal of the MPDES permit. In accordance with ARM 17.30.1313, the permit was complete and administratively extended on July 29, 1999. Additional information was submitted at the Department of Environmental Quality's (Department's) request on October 25, 2007. On June 29, 2008, the Department received an updated renewal application package consisting of DEQ Form 1 and EPA Form 2E. This application requests coverage for the currently permitted Outfall 001 and three new outfalls. The June 2008 application is the application of record.

II. Facility Information

A. Facility Description

The Bureau of Reclamation (USBOR) owns and operates Hungry Horse (HH) Dam and Power Plant, located in Flathead County, on the South Fork Flathead River approximately nine miles southeast of Columbia Falls, Montana. Construction was completed in 1952. The above-ground Power Plant at the base of the dam houses four 107,000 kW hydroelectric generation units.

The application of record requests coverage for the following discharges from the facility:

- Outfall 001 – the currently permitted domestic wastewater treatment plant discharge;
- Outfall 002 (identified on the application as Outfall 004) – Station unwatering sump discharge;
- Outfall 003 (application Outfall 005) – Station drainage sump discharge; and
- Outfall 004 A through D (application Outfalls 006 through 009) – non-contact cooling water discharges from each individual generator associated with any operating combination of the four hydroelectric generators.

Outfall 001

The Hungry Horse (HH) Dam and Power Plant Wastewater Treatment Plant (WWTP) is an early 1960's addition to the dam facility. It is a Suburbia Model DARA-9, extended aeration package plant consisting of a 15,000 gallon concrete aeration chamber equipped with two blowers, filtration, and polishing. Alum is added to the clarifier for phosphorus removal. Soda ash has been used commensurate with alum for effluent pH control. Aeration is followed by a three-stage sand filter with sludge return to the aeration basin. Effluent polishing occurs in the final clarifier before periodic discharge at Outfall 001. The actual discharge in a day is variable (depending on filter backwashes and usage) and intermittent, occurring two to three times per day during the work week and less on weekends. The effluent is released from the WWTP discharge pipe on the south abutment and falls approximately 20 feet into the downstream highly mixed, aerated waters of the dam tail bay. The effluent line is equipped with a Magmeter to measure flow. There are no current disinfection capabilities.

Design capacity for the system is 0.009 million gallons per day (mgd). The WWTP currently treats the domestic wastewater from approximately 17 employees, kitchen and laundry facilities, wash sinks and floor drains. The WWTP discharges between 1,350 and 2,400 gallons of treated wastewater per day (Renewal Application, 2008). Table 1, below, is a summary of the HH Dam WWTP design criteria from the permittee.

Sludge is removed from the system on a five-year schedule and is disposed of at Glacier Gold Compost facility. There is no sludge storage on site. The permittee does not currently have coverage under EPA Region VIII permit number MTG650000, General Permit for

Facilities/Operations that Generate, Treat, and/or Use/Dispose of Sewage Sludge by Means of Land Application, Landfill, and Surface Disposal Under the National Pollutant Discharge Elimination System.

Table 1. Design Criteria Summary – USBOR HH Dam WWTP

Facility Description: Activated sludge package plant with physical phosphorus removal, tertiary sand filtration and no disinfection capabilities.	
Construction Date: early 1960's	Modification Date: NA
Design Year: NA	
Design Population: 112	2007 Population Served: ~17 employees
Design Flow, Average (mgd): 0.009	Design Flow, Peak (mgd): Unknown
Minimum Retention Time (hrs): ~40	
Design BOD Removal (%): Unknown	Design BOD Load (lb/day): 19
Design SS Removal (%): Unknown	Design SS Load (lb/day): 19
Design TN Removal (%): Unknown	Design TN Load (lb/day): Unknown
Design TP Removal (%): Unknown	Design TP Load (lb/day): Unknown
Collection System: Combined <input type="checkbox"/> Separate <input checked="" type="checkbox"/>	
SSO Events (Y/N): No	Number: 0
Bypass Events: No	Number: 0
Inflow and Infiltration contribution (mgd): not quantified	Source: Dam raw water from drains and sumps.
Disinfection: No	Type: none
Discharge Method: Daily batch releases	
Effluent Flow Primary Device: None, use volumetric calculations	
Effluent Secondary Flow Device: Magmeter	
Sludge Storage: None	
Sludge Disposal: Yes, as necessary	EPA Authorization Number: None

Outfall 002

The Station Unwatering Sump (SUS) provides for collection and separation of any prospective oil or grease that may come from the following sources:

- 24-inch draft tube drain header line that dewater the unit draft tubes in preparation for, and during, unit outage work;
- 12-inch penstock unwatering header line that dewater the unit penstocks and spiral cases in preparation for, and during, unit outage work;
- The outlet tube drain lines that dewater the upper and lower sections of the outlet tubes (three in total) in preparation for, and during, maintenance outages, as well as when removing the conduits from service. Water drains to the sump through the tube upper section 12-inch drain valve and the lower section 8-inch drain valve, by way of a 12-inch common header; and

- Additionally, the sump collects any leakage past the normally closed valves associated with the above systems.

The SUS has a permanently installed oil skimmer. There is the potential for the presence of turbine oil or grease as a result of maintenance operations performed inside the water conduits during maintenance outages.

Dependent on water level inside the SUS, the two sump pumps periodically discharge water through a 20-inch header to the downstream tailrace below water level. Each of the two pumps is rated at 4,500 gallons per minute (gpm). Typical combined pump discharges from this source, as measured and recorded on a weekly basis under normal plant conditions, average 594,000 gallons per week (0.085 mgd). Outfall 003(described below) combines with Outfall 002 just prior to discharge at the tailrace.

Outfall 003

The Station Drainage Sump (SDS) provides for collection and separation of any prospective oils, solvents, or grease that may come from the main collection header for the internal plant drainage systems:

- The four-inch turbine pit and gutter drains that collect leakage at equipment floor level; and
- Waterstop leakage at construction and contraction joints.

The SDS has a permanently installed oil skimmer. There is the potential for the presence of oils, grease, or solvents (de-greasers) from the storage, mishandling of material, or maintenance operations performed inside the power plant.

Dependent on water level inside the SDS, the two sump pumps periodically discharge effluent through a 12-inch pipe that combines with the 20-inch discharge pipe from Outfall 002 prior to entering the tailrace. Each of the two pumps is rated at 900 gpm. Typical combined pump discharges from this source, as measured and recorded on a weekly basis under normal plant conditions, average 1,728,000 gallons per week (0.247 mgd).

Outfalls 004A, 004B, 004C, 004D

The power plant generator cooling water for each of the four hydro-generators (A through D) includes supply water and discharges associated with:

- Generator air coolers;
- Thrust bearing oil coolers; and
- Guide bearing oil coolers.

Upstream reservoir water is supplied as once-through non-contact cooling water (nccw) when the generator unit is operating. The nccw is then discharged downstream of the dam into the tail bay below water level. When operational, each unit discharges approximately 1,747 gpm (2.52 mgd). If all four generators are in operation the discharges total approximately 10.1 mgd. There are no chemical additives to the nccw.

Additional Discharges

The renewal application described additional discharges associated with the facility:

- Unaltered water is transferred from all troughs that collect seepage from galleries within the dam structure to the dam left abutment 30-inch diameter pipe. Flow depends on reservoir elevation and no flow estimates are available. This is unaltered reservoir water and as such, no permit is necessary for this discharge. This water combines with left abutment stormwater and is discharged to the dam tail bay.
- Stormwater sources on site include:
 - Left abutment surface runoff (rain and snow melt) includes the hillside, roadways, lower parking lots, and roof drains. This system joins the unaltered water drain identified above, prior to their combined discharge into the tail bay;
 - Left abutment parking lot (on top of the dam) surface runoff from the hillside, roadway, and parking lot (rain and snow); and
 - Right abutment surface runoff (rain and snow melt) includes the hillside, roadways, lower parking lots, and roof drains and discharges to the tail bay from two drains on the tail bay south retaining wall.

The flow rates for these discharges vary dependent on rain fall and snow melt. No specific flow estimates are available. There is a potential for the presence of oils as a result of leakage from vehicles (heavy equipment and winter recreational activities). Best management practices for storm water control are in place to address storm water discharges. The permittee maintains an Oil Pollution Prevention Spill Prevention, Control and Countermeasure plan as required by 40 CFR 112.

The HH Dam and Power Plant is an electrical generating facility under Standard Industrial Classification code 4911 (Office of Management and Budget, Standards Industrial Classification Manual, 1987). In accordance with ARM 17.30.1102(29), this facility is not an industrial activity subject to the storm water permit requirements of Title 17, Chapter 30, Subchapter 11. Best management practices for storm water control are in place to address storm water discharges.

B. Effluent Characteristics

Outfall 001

Effluent data from the facility Discharge Monitoring Reports (DMR) for the Period of Record (POR) June 2002 through September 2007 are summarized in Table 2. Review of the POR data shows that there were no exceedences of effluent limitations.

The June 16, 2004 compliance inspection report noted the need to adhere to 40 CFR 136 procedures and to obtain authorization under EPA Region VIII permit number MTG650000, General Permit for Facilities/Operations that Generate, Treat, and/or Use/Dispose of Sewage Sludge by Means of Land Application, Landfill, and Surface Disposal Under the National Pollutant Discharge Elimination System.

Outfalls 002, 003, and 004A through D - There are no data available for discharges from Outfalls 002, 003, and 004A through D.

Table 2: Outfall 001 DMR Effluent Characteristics ⁽¹⁾ for POR June 2002 through September 2007

Parameter	Location	Units	Previous Permit Limit (7-d/30-d)	Minimum Value	Maximum Value	Average Value	Number of Samples
Flow, Daily Average	Effluent	mgd	-- ⁽²⁾	0.001008	0.003208	0.001876	63
Biochemical Oxygen Demand (BOD ₅)	Influent	mg/L	-- ⁽³⁾	--	--	--	0
	Effluent	mg/L	45/30	<1	10	2.7	63
	Effluent	% removal	-- ⁽³⁾	--	--	--	0
	Effluent	lb/day	2.3 ⁽⁴⁾	0.009	0.121	0.039	63
Total Suspended Solids (TSS)	Influent	mg/L	-- ⁽³⁾	--	--	--	0
	Effluent	mg/L	45/30	<1	27	7.2	63
	Effluent	% removal	-- ⁽³⁾	--	--	--	0
	Effluent	lb/day	2.3 ⁽⁴⁾	0.013	0.545	0.096	63
Fecal Coliform Bacteria ⁽⁶⁾	Effluent	Number per 100 mL	-- ⁽³⁾	--	--	--	0
pH (median value)	Effluent	s.u.	6.0 to 9.0	6.00	7.60	6.83	63
Temperature	Effluent	°C	-- ⁽³⁾	--	--	--	0
Total Residual Chlorine	Effluent	mg/L	-- ⁽³⁾	--	--	--	0
Total Ammonia as N	Effluent	mg/L	-- ⁽²⁾	<0.01	16.0	1.68	63
Total Kjeldahl Nitrogen	Effluent	mg/L	-- ⁽²⁾	<0.10	15.7	2.11	63
Nitrate + Nitrite as N	Effluent	mg/L	-- ⁽²⁾	3.22	25.9	7.53	63
Total Nitrogen ⁽⁷⁾	Effluent	mg/L	-- ⁽²⁾	4.11	26.53	9.65	63
		lb/day	3.1 ⁽⁴⁾	0.066	0.303	0.140	63
Total Phosphorus as P	Effluent	mg/L	1.0	0.03	0.76	0.17	63
		lb/day	0.8 ⁽⁴⁾	0.001	0.015	0.003	63
Dissolved Oxygen	Effluent	mg/L	-- ⁽³⁾	--	--	--	0
Oil and Grease	Effluent	mg/L	-- ⁽³⁾	--	--	--	0
Total Dissolved Solids	Effluent	mg/L	-- ⁽³⁾	--	--	--	0

Footnotes: NA - Not applicable; ND - Non detect

- (1) Conventional and Non-conventional Pollutants only, table does not include information on toxic pollutants.
- (2) No effluent limit in previous permit, monitoring requirement only.
- (3) No limit or monitoring requirement in previous permit.
- (4) Nondegradation Annual Average Load Value, not permit limitation.
- (5) Sample period is April 1 through October 31.
- (6) Instantaneous/Daily Maximum Value.
- (7) Calculated as the sum of TKN and Nitrite + Nitrate as N concentrations.

III. Proposed Technology-based Effluent Limits (TBELs)

A. Applicability

Outfall 001

The Board of Environmental Review has adopted by reference 40 CFR 133 which sets minimum treatment requirements for secondary treatment or equivalent for publicly owned treatment works [ARM 17.30.1209]. National Secondary Standards (NSS) as described in 40 CFR 133, are incorporated into applicable discharge permits. Secondary treatment is defined in terms of effluent quality as measured by BOD₅, TSS, percent removal of BOD₅ and TSS, and pH.

The regulations in 40 CFR 133.105 allow for the application of treatment equivalent-to-secondary effluent limitations (TES) to facilities that meet specific criteria. To qualify for treatment equivalent-to-secondary (TES), the facility must use either a trickling filter or waste stabilization pond as the principle process of treatment as stated in 40 CFR 133.101(g)(2) and the treatment works must also provide significant biological treatment of the wastewater [40 CFR 133.101(g)(3)]. Significant biological treatment is defined as aerobic or anaerobic treatment that consistently achieves 65% removal of BOD₅ [40 CFR 133.101(k)]. The HH Dam WWTP is an activated sludge package plant and hence does not qualify for consideration for TES.

NSS limitations will be applied to the discharge at Outfall 001. Prior to this permit cycle, the permittee was not required to monitor the BOD₅ or TSS percent removal criteria. BOD₅ and TSS percent removal requirements based on NSS (85%) and monitoring will be implemented with this permit renewal [40 CFR 136.102(a) & (b)].

Outfalls 002, 003, and 004A through D - There are no TBELs associated with the discharges from Outfalls 002, 003, and 004A through D.

B. Mass-based Limitations

ARM 17.30.1345(8) requires that all effluent limits be expressed in terms of mass.

Outfall 001

The following equation was used to calculate the BOD₅ and TSS 7-day and 30-day mass-based limitations using the TBELs as proposed above:

$$\text{Load (lb/day)} = \text{Design Flow} \times \text{Concentration Limit (mg/L)} \times 8.34 \text{ (lb}\cdot\text{L)/(mg}\cdot\text{gal)}$$

BOD₅ and TSS Mass-based Load Limitations:

$$30\text{-day average BOD}_5 \text{ load (lb/d)} = (0.009 \text{ mgd})(30 \text{ mg/L})(8.34) = 2.3 \text{ lb/d}$$

$$7\text{-day average BOD}_5 \text{ load (lb/d)} = (0.009 \text{ mgd})(45 \text{ mg/L})(8.34) = 3.4 \text{ lb/d}$$

Outfalls 002, 003, and 004A through D

There are no effluent limits to be expressed in terms of mass associated with these discharges.

C. Nondegradation Load Allocations

The provisions of ARM 17.30.701 - 718 (Nondegradation of Water Quality) apply to new or increased sources of pollution [ARM 17.30.702(18)]. Sources that are in compliance with the conditions of their permit and do not exceed the limits established in the permit or determined from a permit previously issued by the Department are not considered new or increased sources. The facility has been in compliance with permit conditions and hence is not a new or increased source.

Nondegradation threshold values for the HH Dam WWTP (Outfall 001) were calculated for BOD₅, TSS, total nitrogen (TN) and total phosphorus as P (TP) during issuance of the permit in 1995. The BOD₅ and TSS allocations were based on the design flow of 0.009 mgd. The 1995-derived TN and TP allocations (3.1 lb/d and 0.8 lb/d, respectively) were calculated using a population equivalent of 112 people. The nondegradation load allocations in the renewed permit will remain at these values.

The nondegradation load allocations and the actual average loads discharged from the facility for the POR January 2002 through September 2007 are presented below. Actual loads for BOD₅, TSS, TN, and TP were obtained from the facility DMRs. These data indicate that the facility did not exceed the nondegradation load values calculated for TSS, TN, and TP and is not an increased source.

Table 4. Outfall 001 Nondegradation and Actual Loads for POR

Nondegradation Allocated Load Limits			Actual 30-day Average Loads (lb/day)					
Parameter	Units	Annual Average Load	2002	2003	2004	2005	2006	2007
BOD ₅	lb/day	2.3	0.062	0.038	0.037	0.037	0.021	0.055
TSS	lb/day	2.3	0.208	0.066	0.071	0.111	0.094	0.064
TN	lb/day	3.1	0.141	0.140	0.118	0.206	0.132	0.095
TP as P	lb/day	0.8	0.005	0.003	0.002	0.003	0.002	0.002

D. Proposed TBELS

Table 5. Outfall 001 Proposed TBELS

Parameter	Concentration (mg/L)		Load (lb/day)	
	Weekly Average ⁽¹⁾	Monthly Average ⁽¹⁾	Weekly Average ⁽¹⁾	Monthly Average ⁽¹⁾
BOD ₅	45	30	3.4	2.3
TSS	45	30	3.4	2.3
pH, s.u	Within the range of 6.0 to 9.0 (instantaneous)			
BOD ₅ Percent Removal ⁽¹⁾ (%)	85 %			
TSS Percent Removal ⁽¹⁾ (%)	85 %			
(1) See Definition section at end of permit for explanation of terms				

There are no TBELs associated with the discharges from Outfalls 002, 003 and 004A through D.

IV. Water Quality-based Effluent Limits (WQBELs)

A. Scope and Authority

The Montana Water Quality Act (Act) states that a permit may only be issued if the Department finds that the issuance or continuance of the permit will not result in pollution of any state waters [75-5-401(2), Montana Code Annotated (MCA)]. Montana water quality standards at ARM 17.30.637(2) require that no wastes may be discharged such that the waste either alone or in combination with other wastes will violate or can reasonably be expected to violate any standard. ARM 17.30.1344(1) adopts by reference 40 CFR 122.44 which states that MPDES permits shall include limits on all pollutants which will cause, or have a reasonable potential to cause an excursion of any water quality standard, including narrative standards. The purpose of this section is to provide a basis and rationale for establishing effluent limits, based on Montana water quality standards that will protect designated uses of the receiving stream.

The Act authorizes the issuance of point source discharge permits on a listed water body pending completion of a TMDL provided that: 1) the discharge is in compliance with the provisions of 75-5-303 (Nondegradation Policy), MCA; 2) the discharge will not cause a decline in water quality for the parameters for which the water body is listed; and, 3) the minimum treatment requirements under 75-5-703(10), MCA are met.

B. Receiving Water

All discharges from the HH Dam and Power Plant are to the South Fork Flathead River which is in the South Fork Flathead River watershed, identified as USGS Hydrologic Unit Code (HUC) 17010209, and Montana stream segment MT76J001_010. The river is classified as B-1 [ARM 17.30.608(1)(a)]. Class B-1 waters are to be maintained suitable for drinking, culinary and food processing purposes, after conventional treatment; bathing, swimming and recreation; growth and

propagation of salmonid fishes and associated aquatic life, waterfowl and furbearers; and agricultural and industrial water supply [ARM 17.30.623(1)].

The 1996 303(d) list cites this segment of the South Fork Flathead River as partially supportive of aquatic life support and cold water fisheries-trout. Probable causes of impairment include flow alteration and other habitat alterations. The probable sources of impairment are listed as dam construction and upstream impoundment.

In 2006, the 303(d) list identified the river as partially supportive of primary contact recreation caused by flow regime alterations with no specific source. It was considered to be fully supportive of agricultural and industrial uses. Aquatic life support, cold water fisheries-trout and drinking water uses were not assessed.

In March of 2002, the EPA approved the Flathead Lake nutrients TMDL (EPA Reference 8EPR-EP, March 2002). In summary, the TMDL identified nitrogen and phosphorus as the pollutants of concern for the waterbody. It set water quality goals/endpoints for Flathead Lake with an overall 25 percent reduction in long term nitrogen and phosphorus loads to Flathead Lake. These are presented in Attachment A.

The Review of Flathead Lake TMDL Enclosure 2 in the 2002-issued TMDL states, in part, on page 4 of 4 under Section G. Allocation, “This TMDL addresses the need to achieve further reductions in nutrients to attain and maintain water quality goals in Flathead Lake. There is a desire to move forward with controls in the areas of the basin where there is confidence that nutrients need to be controlled (i.e., the developed urban and agricultural areas). The allocation to these areas (i.e., 25 % reduction in nutrient loads) is the first phase of a phased allocation approach. The second phase of allocation will come once there is a better understanding of how the remaining sources affect lake quality. Source (*sic*) under this category include municipal point source facilities, atmospheric deposition, septic tanks, and other non-point sources.” Phase II of this TMDL is under development.

In May 2005, the EPA approved the Flathead River Headwaters TMDL (EPA Reference 8MO, May 24, 2005). In summary, the TMDL acknowledges that the 303(d) listings for this segment of the South Fork Flathead River cite dam construction, upstream impoundment, and flow regime alterations as the causes of impairment. No pollutants are cited as probable causes of impairment on either the 1996, 2002, or 2006 303(d) lists. As a result, the South Fork Flathead River is not discussed further in the TMDL and no waste load allocations were defined for the sole point source on the South Fork Flathead River, the HH Dam facility.

The United States Geological Service (USGS) collects flow and other data for the South Fork Flathead River at gauging station number 12362500 South Fork Flathead River near Columbia Falls, Montana. The 7-day, 10-year low flow (7Q10) value of 122 cubic feet per second (cfs) includes river flow data prior to the start of operation of HH Dam in 1951 (US Department of the Interior US Geological Survey, *Statistical Summaries of Streamflow in Montana and Adjacent Areas, Water Years 1900 through 2002*, Scientific Investigations Report 2004-5266, 2004). The 1994-developed permit established the 7Q10 at 138 cfs for the flow after the construction of the dam. The low flow condition will be established at 138 cfs or 89.2 million gallons per day (mgd) for this permit cycle.

For Outfall 001, this results in a dilution ratio of 9,911 (89.2 mgd/0.009 mgd, the 7Q10 compared to the design discharge flow for the facility). For Outfall 002, the dilution ratio is 1,049 (89.2 mgd/0.085 mgd) and for Outfall 003 it is 361 (89.2/0.247). The dilution ratio for Outfall 004A through D is 35 when one generator is in operation (89.2 mgd/2.52 mgd); 18 when two generators are running; 12 with three generators; and 9 when all four generators are operating.

The Montana Department of Fish, Wildlife, and Parks Montana Fisheries Information System database describes the South Fork Flathead River from the dam (river mile 5.1) to the mouth as an area of outstanding fisheries resource value for both habitat and sports classifications (November 2007). The bull trout is an abundant fluvial/adfluvial species present, spawning elsewhere. The Westslope cutthroat trout is an abundant year-round resident. Kokanee and rainbow trout are incidental year-round residents. The mountain whitefish and largescale sucker are common year-round species while the sculpin, and longnose sucker are species present year-round with abundance unknown.

Ambient water quality data for the South Fork Flathead River are minimal and were obtained from USGS gauging stations 12362500 South Fork Flathead River near Columbia Falls, Montana (December 1948 through October 2007). The data are summarized in Table 6.

Table 6. South Fork Flathead River Ambient Water Quality Monitoring Data

Parameter	Units	Minimum Value	Maximum Value	Long Term Average	Number of Samples
pH, median value	s.u.	7.4	8.0	7.8	12
Temperature	°C	0	15	5.6	67
Total Ammonia as N	mg/L	<0.020	<0.020	<0.020	9
Nitrate/Nitrite as N	mg/L	0.019	0.091	0.064	9
Total Nitrogen	mg/L	0.070	0.160	0.119	9
Total Phosphorus as P	mg/L	<0.008	<0.008	<0.008	9

C. Applicable Water Quality Standards

Discharges to surface waters classified B-1 are subject to the specific water quality standards of ARM 17.30.623 (March 31, 2006), Department Circular DEQ-7 (February 2006), as well as the general provision of ARM 17.30.635 through 637, 641, 645, and 646. In addition to these standards, dischargers are also subject to ARM 17.30 Subchapter 5 (Mixing Zones, November 2004) and Subchapter 7 (Nondegradation of Water Quality, June 30, 2004).

D. Mixing Zone

A mixing zone is an area where the effluent mixes with the receiving water and certain water quality standards may be exceeded [ARM 17.30.502(6)]. The Department must determine the applicability of currently granted mixing zones [ARM 17.30.505(1)]. Mixing zones allowed under a permit

issued prior to April 29, 1993 will remain in effect unless there is evidence that previously allowed mixing zones will impair existing or anticipated uses [ARM 17.30.505(1)(c)].

In accordance with ARM 17.30.517(1)(b), acute water quality standards for aquatic life may not be exceeded in any portion of the mixing zone unless the Department finds that allowing minimal initial dilution will not threaten or impair existing uses. The discharge must also comply with the general prohibitions of ARM 17.30.637(1) which require that state waters, including mixing zones, must be free from substances which will:

- (b) settle to form objectionable sludge deposits or emulsions beneath the surface of the water or upon adjoining shorelines;
- (c) create floating debris, scum, a visible oil film (or be present in concentrations at or in excess of 10 milligrams per liter) or globules of grease or other floating materials;
- (d) produce odors, colors or other conditions as to which create a nuisance or render undesirable tastes to fish flesh or make fish inedible;
- (e) create concentrations or combinations of materials which are toxic or harmful to human, animal, plant or aquatic life; and
- (f) create conditions which produce undesirable aquatic life.

No mixing zone will be granted that will impair beneficial uses [ARM 17.30.506(1)]. Aquatic life-chronic, aquatic life-acute and human health standards may not be exceeded outside of the mixing zone [ARM 17.30.507(1)(a)]. Acute standards may not be exceeded in any part of the mixing zone [ARM 17.30.507(1)(b)], unless the Department finds that there is no lethality to aquatic organisms passing through the mixing zone.

A standard mixing zone may be granted if the discharge to surface water is small in comparison to the volume of the receiving water [ARM 17.30.516(1)], for facilities which discharge less than one mgd, or when mixing is nearly instantaneous. Nearly instantaneous mixing is assumed if the discharge is through an effluent diffuser, when the mean daily flow exceeds the 7-day, 10-year low flow (dilution ratio <1) or the permittee demonstrates through a Department approved study plan that the discharge is nearly instantaneous. A nearly instantaneous mixing zone may not extend downstream more than two (2) river widths. The length of a standard mixing zone for other than a nearly instantaneous mixing zone, must not extend downstream more than 10 times the stream width [ARM 17.30.516(4)].

Effluent discharges which do not qualify for a standard mixing zone must apply for a source specific mixing zone in accordance with ARM 17.30.518 and must conform to the requirements of 75-5-301(4), MCA which states that mixing zones must be the smallest practicable size; have minimal effects on uses; and, have definable boundaries. ARM 17.30.515(2) states that a person applying for a mixing zone must indicate the type of mixing zone and provide sufficient detail for the Department to make a determination regarding the authorization of the mixing zone under the rules of Subchapter 5.

Outfall 001

The HH Dam WWTP design discharge flow is less than 1.0 mgd (0.009 mgd) and the dilution ratio is greater than 100:1 (9,911). A standard mixing zone may be granted if the discharge to surface water is small in comparison to the volume of the receiving water [ARM 17.30.516(1)(d)]. The

discharge qualifies for a standard mixing zone and the Department will use the full 7Q10 dilution flow of 89.2 mgd to develop chronic effluent limitations where applicable [ARM 17.30.516(3)(a)].

Review of the administrative file shows that the 1994 Statement of Basis established the mixing zone using Best Professional Judgment. The mixing zone was defined as extending downriver to a point just beyond the Devil's Elbow feature, at 7,500 feet downstream from the outfall location. With this permit renewal, the mixing zone will be established at the smallest practicable size and to adhere to the definition of a standard mixing zone. The standard mixing zone will extend 2,400 feet downstream of Outfall 001. This is a point no more than 10 times the stream width at the point of discharge (approximately 240 feet).

Outfall 002

The SUS discharge flow is less than 1.0 mgd (approximately 0.085 mgd) and the dilution ratio is greater than 100:1 (1,049). A standard mixing zone may be granted if the discharge to surface water is small in comparison to the volume of the receiving water [ARM 17.30.516(1)(d)]. The discharge qualifies for a standard mixing zone and the Department will use the full 7Q10 dilution flow of 89.2 mgd to develop chronic effluent limitations where applicable [ARM 17.30.516(3)(a)].

The mixing zone has not been described previously for this outfall. The standard mixing zone will be defined at 2,400 feet in length down river from the outfall location to a point approximately ten times the stream width at 7Q10 and to coincide with the mixing zone for Outfall 001.

Outfall 003

The SDS discharge flow is less than 1.0 mgd (approximately 0.247 mgd) and the dilution ratio is greater than 100:1 (361). A standard mixing zone may be granted if the discharge to surface water is small in comparison to the volume of the receiving water [ARM 17.30.516(1)(d)]. The discharge qualifies for a standard mixing zone and the Department will use the full 7Q10 dilution flow of 89.2 mgd to develop chronic effluent limitations where applicable [ARM 17.30.516(3)(a)].

The mixing zone has not been described previously for this outfall. The standard mixing zone will be defined at 2,400 feet in length down river from the outfall location to a point approximately ten times the stream width at 7Q10 and to coincide with the mixing zone for Outfalls 001 and 002.

Outfall 004A through D

The HH Power Plant generator cooling water discharge flow is dependent on the number of generators in operation. To assure an appropriate mixing zone for the nccw discharges, the mixing zone will be developed with all four generators in operation. The daily flow for the full discharge is approximately 10.1 mgd. The dilution ratio is 9. The Department will use the full 7Q10 dilution flow of 89.2 mgd to develop chronic effluent limitations where applicable [ARM 17.30.516(3)(a)].

The mixing zone has not been described previously for this outfall. The mixing zone will be modified in accordance with ARM 17.30. 515(1)(d) to 2,400 feet in length down river from the outfall location to a point approximately ten times the stream width at 7Q10 and to coincide with the mixing zone for Outfalls 001, 002, and 003.

E. Basis and Proposed Water Quality-based Effluent Limits

ARM 17.30.1345 requires WQBELs to be developed for any pollutant for which there is reasonable potential (RP) for discharges to cause or contribute to exceedences of instream numeric or narrative water quality standards. RP calculations utilize the receiving water concentration, the maximum projected effluent concentration, the design flow of the wastewater treatment facility, and the applicable receiving water flow.

The Department uses a mass balance equation to determine RP (*Equation 1*).

$$C_{RP} = \frac{C_E Q_E + C_S Q_S}{Q_E + Q_S} \quad (\text{Eq. 1})$$

Where:

C_{RP}	=	receiving water concentration (RWC) after mixing, mg/L
C_E	=	maximum projected effluent concentration, mg/L
C_S	=	RWC upstream of discharge, mg/L
Q_S	=	applicable receiving water flow, mgd
Q_E	=	facility design flow rate, mgd

Outfall 001

Parameters typically present in sewage wastewaters that may cause or contribute to a violation of water quality standards include the conventional pollutants such as biological material (as measured by BOD₅), suspended solids, oil & grease, pathogenic bacteria, and pH; the non-conventional pollutants such as total residual chlorine, total ammonia, total nitrogen, and total phosphorus; and the carcinogenic and toxic pollutants such as organic substances and metals.

1. Conventional Pollutants

Total Suspended Solids (TSS), and Biological Oxygen Demand (BOD₅) - The facility provides a significant reduction in biological material and solids through secondary treatment (Section III). The permittee will be required to meet the 85 percent removal limitations for BOD₅ and TSS in addition to any concentration limits on BOD₅ and TSS. No additional WQBELs will be required for these parameters.

pH - Pursuant to ARM 17.30.623(2)(c), the induced variation of hydrogen ion concentration within the range of 6.5 to 8.5 must be less than 0.5 pH units. Natural pH outside this range must be maintained without change. Natural pH above 7.0 must be maintained above 7.0.

Oil and Grease (O&G) - The previous permit did not limit O&G in the effluent. No monitoring for this parameter has been performed. There is a lack of information available to perform an RP assessment. Due to the use of kitchen and laundry facilities and wash sinks on site, oils and greases can be treated by the WWTP. Quarterly monitoring for O&G will be conducted. No concentration limit will be implemented at this time.

***Escherichia coli* (E. coli) Bacteria** - In past permit cycles, the WWTP effluent has had no bacteria limits or monitoring requirements in effect due the large dilution flow of the receiving water. ARM

17.30.505(2) states that if the Department determines that a mixing zone may interfere with or threaten a beneficial use, discharge limitations will be modified and if necessary, require the applicable numeric water quality criteria to be met at the end of the discharge pipe. The Department is not granting a mixing zone for *E. coli* bacteria based on the following consideration; ARM 17.30.637(1)(e) which requires that state waters must be free from substances that are harmful or toxic to humans. Therefore, limitations and monitoring *E. coli* bacteria will be implemented with this permit cycle.

The permit will incorporate the Montana state standards for *E. coli* bacteria (Circular DEQ-7, February 2006). The applicable standards for *E. coli* are:

- a. April 1 through October 31, of each year, the geometric mean number of the microbial species *E. coli* must not exceed 126 colony forming units (cfu) per 100 milliliters (mL), nor are 10% of the total samples during any 30-day period to exceed 252 cfu per 100 mL (ARM 17.30.623(2)(a)(i)); and
- b. November 1 through March 31, of each year, the geometric mean number of *E. coli* shall not exceed 630 cfu per 100 mL and 10% of the samples during any 30-day period may not exceed 1,260 cfu per 100 mL (ARM 17.30.623(2)(a)(ii)).

To meet the new *E. coli* bacteria limits, interim limitations allowing the permittee to bring the necessary systems on-line to provide year-round disinfection will be included in this permit. Through June 30, 2010, no limitations on *E. coli* bacteria numbers will be implemented but interim weekly monitoring for *E. coli* bacteria will be required. Starting July 1, 2010, the final *E. coli* bacteria limitations will become effective.

2. Nonconventional Pollutants

Total Ammonia as N - Total ammonia as N limits are developed based on standards that account for a combination of pH and temperature of the receiving stream, the presence or absence of salmonid species, and the presence or absence of fish in early life stages. Because pH and temperature can vary greatly on a seasonal basis, as can the presence or absence of fish in early life stages, DEQ Circular DEQ-7 (February 2006) allows for the determination of ammonia standards and the resulting limits on a seasonal basis. Salmonid fishes and their early life stages are presumed present year-round.

Table 8, presents the total ammonia as N water quality standards for the South Fork Flathead River using the minimal water quality data in Table 6.

Table 8. Total Ammonia as N Water Quality Standards for Receiving Water.

Condition	Period ⁽¹⁾	Salmonids Present	Early Life Stages Present	Ambient Condition		Water Quality Standard ⁽²⁾
				pH	Temperature °C	
Acute	Annual	Yes	NA	8.0 ⁽³⁾	NA	5.62
Chronic	Summer	Yes	Yes	8.0 ⁽⁴⁾	5.9 ⁽⁴⁾	2.43
Chronic	Winter	Yes	Yes	7.8 ⁽⁴⁾	5.0 ⁽⁴⁾	3.18

Footnotes: NA – Not Applicable
 (1) Winter period is taken to be November 1 through March 31; summer period is taken to be April 1 through October 31.
 (2) Acute - maximum daily; Chronic - 30-day average concentration.
 (3) Based on 95th percentile of annual data.
 (4) Based on 75th percentile of values in the applicable period.

The maximum reported total ammonia as N value, 16.0 mg/L, exceeds the state standards for total ammonia as nitrogen and a defined mixing zone is necessary for this parameter. Reasonable potential (RP) to exceed the acute water quality standard for total ammonia as N was assessed using *Equation 1*.

Where:

C_{RP} = receiving water concentration (RWC) after mixing, mg/L
 C_E = maximum projected effluent concentration, mg/L
 C_S = RWC upstream of discharge, mg/L
 Q_S = applicable receiving water flow, mgd
 Q_E = facility design flow rate, mgd

The projected maximum concentration for total ammonia as N was found following the method recommended by the EPA in the *Technical Support Document for Water Quality-Based Toxics Control* (1991). A coefficient of variation (CV) of 1.67 was calculated by dividing the standard deviation (2.81 mg/L) by average concentration (1.68 mg/L), based on monthly self-reported data for total ammonia as N concentrations. A multiplier of 1.9 was determined using Table 3-2 in the TSD (given a CV of 1.67, a sample size of 63 at the 95% confidence interval). The maximum reported effluent value for total ammonia as N was 16.0 mg/L. The multiplier times the maximum concentration (1.9*16.0 mg/L) is 30.4 mg/L.

Therefore, by *Equation 1*, where:

C_{RP} = receiving water concentration (RWC) after mixing, mg/L
 C_E = maximum effluent concentration, 30.4 mg/L
 C_S = RWC upstream of discharge, 0.02 mg/L
 Q_S = applicable receiving water flow, 89.2 mgd
 Q_E = facility design flow rate, 0.009 mgd

$$C_{RP} = \frac{(0.009 * 30.4) + (89.2 * 0.02)}{(0.009 + 89.2)} = 0.0231 \text{ mg/L}$$

This value is less than the acute ammonia standard of 2.43 mg/L, therefore, RP does not exist for this parameter and no limit is necessary.

Nitrate Plus Nitrite as Nitrogen ($\text{NO}_{2/3}^-$) –Nitrate is an oxidized form of nitrogen which is a prevalent pollutant in treated domestic wastewater. Activated sludge treatment is a secondary biological process that uses oxidation to treat domestic wastewater and produces nitrate nitrogen. Nitrite nitrogen is not normally present in measurable quantities in treated municipal wastewater. The state standard for nitrate as nitrogen for surface water is 10 mg/L (DEQ-7, February 2006). The maximum reported nitrate plus nitrite as nitrogen ($\text{NO}_{2/3}^-$) value, 25.9 mg/L, exceeds the state standard for nitrate as nitrogen.

To determine if the $\text{NO}_{2/3}^-$ concentrations in the effluent will create an exceedence of the state standard in the South Fork Flathead River after mixing, a reasonable potential (RP) analysis was completed using *Equation 1*, where:

$$\begin{aligned}C_{\text{RP}} &= \text{Receiving water concentration (RWC) after mixing, mg/L} \\C_{\text{E}} &= \text{Projected maximum effluent concentration, 36.3 mg/L} \\C_{\text{S}} &= \text{Receiving water concentration, 0.064 mg/L} \\Q_{\text{S}} &= \text{Applicable receiving water flow, 89.2 mgd} \\Q_{\text{E}} &= \text{Facility design flow rate, 0.009 mgd}\end{aligned}$$

The projected maximum concentration for $\text{NO}_{2/3}^-$ was found following the method recommended by the EPA in the “Technical Support Document for Water Quality-Based Toxics Control” (1991). A coefficient of variation (CV), 0.60, was calculated by dividing the standard deviation (4.55 mg/L) by average concentration (7.53 mg/L), based on self-reported $\text{NO}_{2/3}^-$ concentrations. A multiplier of 1.4 was determined using Table 3-2 in the TSD (given a CV of 0.6, a sample size of 63 at the 95% confidence interval.) The maximum reported effluent $\text{NO}_{2/3}^-$ was 25.9 mg/L. The multiplier times the maximum concentration (1.4*25.9 mg/L) is 36.3 mg/L.

$$C_{\text{RP}} = \frac{(0.009 * 36.3) + (89.2 * 0.064)}{(0.009 + 89.2)} = 0.068 \text{ mg/L } \text{NO}_{2/3}^- \text{ as N}$$

The resulting downstream mixed concentration, 0.068 mg/L, is below the standard of 10 mg/L therefore, RP does not exist for this parameter and no limit is necessary.

Nutrients [Total Nitrogen (TN) and Total Phosphorus as P (TP)]: Outfall 001 has had an average monthly limitation for total phosphorus as P of 1.0 mg/L; the limit will be maintained during this permit cycle. The South Fork Flathead River is not listed as impaired for nitrogen. The HH Dam WWTP discharge is a minor point source with a substantial dilution ratio (>9,911). No limit for TN is necessary at this time. The permittee will be expected to continue monitoring the effluent for TN and TP parameters during this permit cycle to support development of Phase II of the Flathead Lake nutrient TMDL.

Dissolved Oxygen (DO) – The South Fork Flathead River is not listed as impaired for organic enrichment/DO at HH Dam. Review of the limited instream DO data for below HH Dam shows DO levels in the river were measured between 10 mg/L and 12.5 mg/L for all times of the year. The HH

Dam WWTP discharge is a minor point source with a substantial dilution ratio (9,911). No limit or monitoring for DO in the effluent is necessary.

Total Residual Chlorine (TRC) - The facility does not currently have chlorination capabilities. In the event chlorination is utilized on site, the effluent total residual chlorine average monthly limit will be 0.011 mg/L and the maximum daily limitation will be 0.019 mg/L at the end of pipe.

3. Toxic Pollutants

ARM 17.30.623(2)(h) states that concentrations of carcinogenic, bio-concentrating, toxic, or harmful parameters which would remain in the water after conventional treatment may not exceed the applicable standards specified in Department Circular DEQ-7 (February 2006).

Total Recoverable Metals – Metals are not expected to be pollutants of concern for this outfall. The HH Dam WWTP discharge is a minor point source with a substantial dilution ratio (>26,000). No limitations or monitoring for metals are proposed for this permit cycle.

Whole Effluent Toxicity (WET) Testing - ARM 17.30.637(1)(d) requires that state water be free from substances attributable to municipal waste that create condition which are harmful or toxic to human, animal, plant or aquatic life, except the Department may allow limited toxicity in a mixing zone provided that there is no acuter lethality to organisms. The HH Dam WWTP is a small discharge into the main flow of the river with a substantial dilution ratio; toxicity is unlikely in the mixing zone. No WET testing will be required with this permit cycle.

Outfalls 002 and 003

There are no sources of nutrients and biological materials to the SUS or SDS discharges. However, due to the presence of turbine oils and greases on site, oil and grease and volatile organic carbon substances are of concern for the sump discharges.

1. Conventional Pollutants

Total Suspended Solids (TSS), Biological Oxygen Demand (BOD₅), *Escherichia coli* (*E. coli*) Bacteria – there are no sources of these pollutants in the discharges, no monitoring or limitations are proposed at this time.

pH –Pursuant to ARM 17.30.623(2)(c), the induced variation of hydrogen ion concentration within the range of 6.5 to 8.5 must be less than 0.5 pH units. Natural pH outside this range must be maintained without change. Natural pH above 7.0 must be maintained above 7.0.

Oil and Grease (O&G) - No monitoring for this parameter has been performed on this discharge. There is a lack of information available to perform an RP assessment. Due to the potential for the presence of turbine oils and greases in these discharges, quarterly monitoring for O&G will be conducted on both discharges after the oil skimmers. No concentration limit will be implemented at this time.

2. Non-Conventional Pollutants

Total Ammonia as N, Nutrients [Total Nitrogen (TN) and Total Phosphorus as P (TP), Dissolved Oxygen (DO), Total Residual Chlorine (TRC)] – there are no sources of these pollutants in the discharges, no monitoring or limitations are proposed at this time

3. Toxic Pollutants

ARM 17.30.623(2)(h) states that concentrations of carcinogenic, bio-concentrating, toxic, or harmful parameters which would remain in the water after conventional treatment may not exceed the applicable standards specified in Department Circular DEQ-7 (February 2006).

Total Recoverable Metals – Monitoring for metals in the SUS or SDS effluents has not been performed previously at this facility. There is a lack of information available to perform an RP assessment. However, metals are not expected to be pollutants of concern for these outfalls except as related to potential equipment wear. No limitations or monitoring for metals are proposed for this permit cycle. The permittee will be required to perform the applicable metals analyses to support the renewal application process in the future.

Organic Substances - The Power Plant SUS and SDS discharges have the potential to contain O&G, as discussed in Section II. A. of this Statement of Basis. No monitoring for organic substances has been performed on these outfalls and RP cannot be assessed. The permittee has installed oil skimmers to provide treatment of sump waters prior to discharge. The combined discharges from Outfalls 002 and 003 approximate a 0.33 mgd discharge into the main flow of the river with a substantial dilution ratio (270); toxicity is unlikely in the mixing zone. The permittee will be required to perform the applicable organic substances analyses to support the renewal application process in the future.

Whole Effluent Toxicity (WET) Testing - ARM 17.30.637(1)(d) requires that state water be free from substances attributable to municipal waste that create condition which are harmful or toxic to human, animal, plant or aquatic life, except the Department may allow limited toxicity in a mixing zone provided that there is no acuter lethality to organisms. The combined discharges from Outfalls 002 and 003 approximate a 0.33 mgd discharge into the main flow of the river with a substantial dilution ratio (>777); toxicity is unlikely in the mixing zone. No WET testing will be required with this permit cycle.

Outfall 004A through D

The once-through non-contact cooling water discharges associated with each generator unit have no known additives or pollutant sources except temperature. Discharge flow is approximately 2.52 mgd per unit, for a maximum discharge of 10.1 mgd when all four units are in operation. The dilution ratio when all four generators are running is 9.

Temperature – Prior to August 1995, the HH Dam released water from Hungry Horse Reservoir at a fixed 4 to 5°C, year-round, due to the lack of a selective withdrawal release structure. The installation of the selective withdrawal structure in 1995 has allowed for control of releases to mimic the natural thermal regime in the downstream waters. The renewal application describes that the

dam operators balance the temperature input from the nccw discharges with the use of the selective withdrawal structure.

The receiving water is not currently listed as impaired for temperature on the 303(d) list. There are no data regarding temperature for these discharges, and RP cannot be assessed at this time. The permittee will be expected to continuously monitor and report effluent temperature for each individual generator nccw discharge during this permit cycle. Maximum daily, minimum daily, and average monthly temperatures for each generator (A through D) will be reported on the discharge monitoring reports. No temperature limit will be implemented at this time.

V. Proposed Final Effluent Limitations

Outfall 001

Interim Limitations

The following interim effluent limitations will be applied to the discharge at Outfall 001, effective immediately and remain in effect for the duration of the permit cycle.

Parameter	Units	Average Monthly Limit ⁽¹⁾	Average Weekly Limit ⁽¹⁾	Maximum Daily Limit ⁽¹⁾
BOD ₅	mg/L	30	45	--
	lb/day	2.3	3.4	--
TSS	mg/L	30	45	--
	lb/day	2.3	3.4	--
Total Phosphorus as P	mg/L	1.0	--	--
	lb/day	0.8	--	--
Footnotes: (1) See Definition section at end of permit for explanation of terms.				

pH: Effluent pH from Outfall 001 shall remain between 6.0 and 9.0 standard units (instantaneous minimum and instantaneous maximum). For compliance purposes, any single analysis or measurement beyond this limitation shall be considered a violation of the conditions of this permit.

85 Percent (%) Removal Requirement for BOD₅: The arithmetic mean of the BOD₅ for effluent samples collected in a period of 30 consecutive days shall not exceed 15% of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85% removal). This is in addition to the concentration limitations on BOD₅.

85 Percent (%) Removal Requirement for TSS: The arithmetic mean of the TSS for effluent samples collected in a period of 30 consecutive days shall not exceed 15% of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85% removal). This is in addition to the concentration limitations on TSS.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

There shall be no discharge which causes visible oil sheen in the receiving stream.

Final Limitations

The following final effluent limitations will be applied to the discharge at Outfall 001, effective July 1, 2010 and remain in effect for the duration of the permit cycle.

Parameter	Units	Average Monthly Limit ⁽¹⁾	Average Weekly Limit ⁽¹⁾	Maximum Daily Limit ⁽¹⁾
BOD ₅	mg/L	30	45	--
	lb/day	2.3	3.4	--
TSS	mg/L	30	45	--
	lb/day	2.3	2.25	--
Total Phosphorus as P	mg/L	1.0	--	--
	lb/day	0.8	--	--
<i>E. coli</i> Bacteria ⁽²⁾	cfu/100 mL	126	--	252
<i>E. coli</i> Bacteria ⁽³⁾	cfu/100 mL	630	--	1,260
Total Residual Chlorine	mg/L	0.011	--	0.019
Footnotes: (1) See Definition section at end of permit for explanation of terms. (2) This limit applies during the period April 1 through October 31. (3) This limit applies during the period November 1 through March 31.				

pH: Effluent pH from Outfall 001 shall remain between 6.0 and 9.0 standard units (instantaneous minimum and instantaneous maximum. For compliance purposes, any single analysis or measurement beyond this limitation shall be considered a violation of the conditions of this permit.

85 Percent (%) Removal Requirement for BOD₅: The arithmetic mean of the BOD₅ for effluent samples collected in a period of 30 consecutive days shall not exceed 15% of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85% removal). This is in addition to the concentration limitations on BOD₅.

85 Percent (%) Removal Requirement for TSS: The arithmetic mean of the TSS for effluent samples collected in a period of 30 consecutive days shall not exceed 15% of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85% removal). This is in addition to the concentration limitations on TSS.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

There shall be no discharge which causes visible oil sheen in the receiving stream.

Outfalls 002, 003, and 004A through D

There are no limits proposed for Outfalls 002, 003, and 004A through D.

VI. Self-Monitoring Requirements

All analytical procedures must comply with the specifications of 40 CFR Part 136. Samples shall be collected, preserved and analyzed in accordance with approved procedures listed in 40 CFR 136. Starting with the effective date of the permit and lasting for the duration of the permit cycle, self-monitoring of effluent discharged at Outfall 001 shall be conducted at the discharge point from the package plant; self-monitoring of effluents discharged at Outfalls 002 and 003 shall be conducted at the discharge points from the installed oil skimmers. Monitoring points for the nccw discharges specific to each generator unit (Outfall 004A through D) will be established by the permittee at locations that will provide representative data for the discharges prior to mixing with other discharges or the receiving water. All samples will reflect the nature and effect of the discharge. Increased sampling frequencies will support assessment of compliance with maximum daily, 7-day and 30-day average limitations.

Outfall 001 Hungry Horse Dam WWTP Effluent Monitoring Requirements				
Parameter	Unit	Sample Location	Sample Frequency	Sample Type ⁽¹⁾
Flow	mgd	Effluent	Daily	Instantaneous
Flow ⁽²⁾	mgd	Effluent	Continuous	⁽²⁾
5-Day Biological Oxygen Demand (BOD ₅)	mg/L	Influent ⁽³⁾	1/Quarter	Grab
	mg/L	Effluent	1/Week	Grab
	lb/day	Effluent	1/Month	Grab
	% Removal ⁽⁴⁾	Effluent	1/Quarter	Calculated
Total Suspended Solids (TSS)	mg/L	Influent ⁽³⁾	1/Quarter	Grab
	mg/L	Effluent	1/Week	Grab
	lb/day	Effluent	1/Month	Grab
	% Removal ⁽⁴⁾	Effluent	1/Quarter	Calculated
pH	s.u.	Effluent	1/Week	Instantaneous
<i>E. coli</i> Bacteria ⁽⁵⁾	cfu/100 mL	Effluent	1/Week	Grab
Temperature	°C	Effluent	1/Week	Instantaneous
Total Residual Chlorine ⁽⁶⁾	mg/L	Effluent	Daily	Grab
Total Ammonia as N	mg/L	Effluent	1/Month	Grab
Nitrate + Nitrite as N	mg/L	Effluent	1/Month	Grab
Total Kjeldahl Nitrogen	mg/L	Effluent	1/Month	Grab
Total Nitrogen as N ⁽⁶⁾	mg/L	NA	1/Month	Calculated
	lb/day	NA	1/Month	Calculated
Total Phosphorus as P	mg/L	Effluent	1/Month	Grab
	lb/day	NA	1/Month	Calculated
Oil & Grease ⁽⁷⁾	mg/L	Effluent	1/Quarter	Grab
Total Dissolved Solids (TDS)	mg/L	Effluent	1/Quarter	Grab

Footnotes:

- (1) See Definitions section at end of permit for explanation of terms.
- (2) Requires recording device or totalizer effective July 1, 2010. Permittee shall report daily maximum and daily average flow on DMR.
- (3) Influent BOD₅ and TSS samples shall be collected even if no effluent discharge occurs in the monitoring period.
- (4) Percent (%) Removal shall be calculated using the monthly average values.
- (5) Report geometric mean if more than one sample is collected in the reporting period.
- (6) The permittee is only required to sample for total residual chlorine if chlorine is used as a disinfectant in the treatment process. If chlorine is *not* used, write "NA" on the DMR for this parameter.
- (7) Calculated as the sum of Nitrate + Nitrite as N and Total Kjeldahl Nitrogen concentrations.
- (8) Use EPA Method 1664, Revision A: N-Hexane Extractable Material (HEM), or equivalent.

Outfalls 002 and 003 Sump Effluent Monitoring Requirements				
Parameter	Unit	Sample Location	Sample Frequency	Sample Type ⁽¹⁾
Flow	mgd	Effluent	1/Week	Instantaneous
Flow ⁽²⁾	mgd	Effluent	Continuous	⁽²⁾
pH	s.u.	Effluent	1/Week	Instantaneous
Temperature	°F	Effluent	1/Week	Instantaneous
Oil & Grease ⁽³⁾	mg/L	Effluent	1/Quarter	Grab
Footnotes: (1) See Definitions section at end of permit for explanation of terms. (2) Requires recording device or totalizer effective July 1, 2010. Permittee shall report daily maximum and daily average flow on DMR. (3) Use EPA Method 1664, Revision A: N-Hexane Extractable Material (HEM), or equivalent.				

Outfall 004 NCCW Effluent Monitoring Requirements				
Parameter	Unit	Sample Location	Sample Frequency	Sample Type ⁽¹⁾
Flow	mgd	Effluent	1/Week	Instantaneous
Flow ⁽²⁾	mgd	Effluent	Continuous	⁽²⁾
Temperature	°F	Effluent	1/Week	Instantaneous
Temperature ⁽³⁾	°F	Effluent	Continuous	⁽³⁾
Footnotes: (1) See Definitions section at end of permit for explanation of terms. (2) Requires recording device or totalizer effective July 1, 2010. Permittee shall report daily maximum and daily average flow on DMR. (3) Continuous temperature monitoring requirement effective July 1, 2010.				

VI. Nonsignificance Determination

The proposed effluent limits and discharge flows for the HH Dam facility are not new or increased sources of pollutants pursuant to ARM 17.30.702(18). Therefore, a nonsignificance analysis is not required [ARM 17.30.705(1)].

VII. Special Conditions

1. Effluent Flow Monitoring

By ARM 17.30.1342(8), a permittee shall furnish to the Department, any information which the Department may request to determine compliance with the permit. To assess reasonable potential to exceed water quality standards it is necessary to have effluent flow and pollutant concentration values. Self-monitoring of the effluents for pollutants of concern and flow is being proposed for this permit cycle to ascertain the need for permit limits in the next permit cycle.

The permittee does not currently have continuous flow monitoring or recording/totalizing capability on Outfalls 001, 002, and 003. A volumetric calculation is performed to determine daily flow. Outfalls 002 and 003 have no flow monitoring capabilities installed at this time; pump run times are used to monitor weekly flow by dam operations personnel.

A special condition will be included in the permit allowing the permittee to plan for and install continuous flow monitoring and recording/totalizing capabilities on these outfalls by midnight June 30, 2010.

2. Outfall 004A through D Temperature Monitoring

The permittee does not currently monitor or report turbine generator unit nccw temperatures. The permit will include a requirement to install continuous temperature monitoring capabilities on the nccw for each generator unit by midnight June 30, 2010.

VIII. Other Information

On September 21, 2000, a US District Judge issued an order stating that until all necessary total maximum daily loads (TMDLs) under Section 303(d) of the Clean Water Act are established for a particular water quality limited segment, the State is not to issue any new permits or increase permitted discharges under the MPDES program. The order was issued under the lawsuit Friends of the Wild Swan vs. US EPA et al, CV 97-35-M-DWM, District of Montana, Missoula Division.

The renewal of this permit does not conflict with Judge Molloy's order because the receiving water is not listed as impaired for any pollutants of concern and the permitted discharge does not represent a new or increased source of pollutants under the MPDES program.

IX. Information Sources

1. Administrative Rules of Montana Title 17 Chapter 30 - Water Quality
 - a. Sub-Chapter 2 - Water Quality Permit and Application Fees, November 2003.
 - b. Sub-Chapter 5 - Mixing Zones in Surface and Ground Water, November 2004.
 - c. Sub-Chapter 6 - Montana Surface Water Quality Standards and Procedures, September 2004.
 - d. Sub-Chapter 7- Nondegradation of Water Quality, November 2004.
 - e. Sub-Chapter 10 - Montana Ground Water Pollution Control System, September 2004.
 - f. Sub-Chapter 11 - Storm Water Discharges,
 - g. Sub-Chapter 12 - Montana Pollutant Discharge Elimination System (MPDES) Standards, March 2003.
 - h. Sub-Chapter 13 - Montana Pollutant Discharge Elimination System (MPDES) Permits, March 2003.
2. Clean Water Act § 303(d), 33 USC 1313(d) Montana List of Waterbodies in Need of Total Maximum Daily Load Development, 1996 and 2004.
3. Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. §§ 1251-1387, October 18, 1972, as amended 1973-1983, 1987, 1988, 1990-1992, 1994, 1995 and 1996.
4. Montana Code Annotated Title 75 - Environmental Protection Chapter 5 - Water Quality, October 2002.
5. Montana Department of Environmental Quality Circular DEQ-2, Design Standards for Wastewater Facilities, September 1999.
6. Montana Department of Environmental Quality Circular DEQ-7, Montana Numeric Water Quality Standards, February 2006.
7. Montana Department of Fish Wildlife and Parks *Model Development to Establish Integrated Operational Rule Curves for Hungry Horse and Libby Reservoirs-Montana*, for the U. S. Department of Energy, Bonneville Power Administration, Project Number 83-467, January 1996.
8. Montana Department of Fish Wildlife and Parks D. Skaar, Spawning Times of Montana Fishes, March 2001.
9. Montana Pollutant Discharge Elimination System (MPDES) Permit Number MT0022578:
 - a. Administrative Record
 - b. Renewal Application Short Form 2A, March 1999
 - c. Supplemental Information: EPA Form 2A and DEQ Form-1, October 2007.
 - d. Updated EPA Form 2A, June 2008.
10. US Code of Federal Regulations, 40 CFR Part 112- Oil Pollution Prevention.
11. US Code of Federal Regulations, 40 CFR Parts 122-125, 130-133, & 136.

12. US Code of Federal Regulations, 40 CFR Part 403 – General Pretreatment Regulations for Existing and New Sources of Pollution.
13. US Code of Federal Regulations, 40 CFR Part 503 – Standards for the Use or Disposal of Sewage Sludge.
14. US Department of the Interior US Geological Survey, *Statistical Summaries of Streamflow in Montana and Adjacent Areas, Water Years 1900 through 2002*, Scientific Investigations Report 2004-5266, 2004.
15. US Environmental Protection Agency (EPA) *Technical Support Document for Water Quality-Based Toxics Control*, EPA/505/2-30-001, March 1991.
16. US EPA NPDES Permit Writers' Manual, EPA 833-B-96-003, December 1996.
17. US EPA Region VIII NPDES Whole Effluent Toxics Control Program, August 1997.
18. US EPA Ref. 8EPR-EP Flathead Lake (nutrients) Total Maximum Daily Load, March 2002
19. US EPA NPDES Permit Writers' Course Manual, EPA-833-B-91-001, April 2003.
20. US EPA Ref. 8MO Flathead River Headwaters Total Maximum Daily Load, May 2005.

Completed November 16, 2007/July 28, 2008 Melee K. Valett

Attachment A.

Waterbody Name*	TMDL Parameter / Pollutant	Water Quality Goal/Endpoint	TMDL	TMDL Section Type	Supporting Documentation (partial list)
Flathead Lake * USGS HUC 17010208 Segments: MT76LJ006-1 (ID # 1996 List) MT76O003-010 (ID # 2000 List)	Nitrogen Phosphorus	<ul style="list-style-type: none"> 80 g Carbon/m²/yr No declining trend in hypolimnionic dissolved oxygen No measurable blooms of <i>Anabaena</i> or other pollution algae 1.0 µg/L of chlorophyll <i>a</i> Maintaining or decreasing near-shore algal growth on rocks 5.0 µg/L total phosphorus <0.5 mg/L soluble reactive phosphorus 95 µg/L total nitrogen 30 µg/L nitrite + nitrate <1.0 µg/L ammonia 	<ul style="list-style-type: none"> 25 percent reduction in long term nitrogen and phosphorus loads 	303(d)(1)	<ul style="list-style-type: none"> <u>Nutrient Management Plan and Total Maximum Daily Load for Flathead Lake, Montana</u> (MT DEQ, December 28, 2001) “Water quality data and analyses to aid in the development of revised water quality targets for Flathead Lake, Montana; Phase I of a cooperative study to determine total maximum daily loads of nitrogen and phosphorus.” Open file Report 142-97. Flathead Lake Biological Station, University of Montana, Polson, MT

* An asterisk indicates the waterbody has been included on the State’s Section 303(d) list of waterbodies in need of TMDLs.
Flathead Lake Total Maximum Daily Load (US EPA Ref. 8EPR-EP, March 2002)